FIG. 1A

FIG. 1B

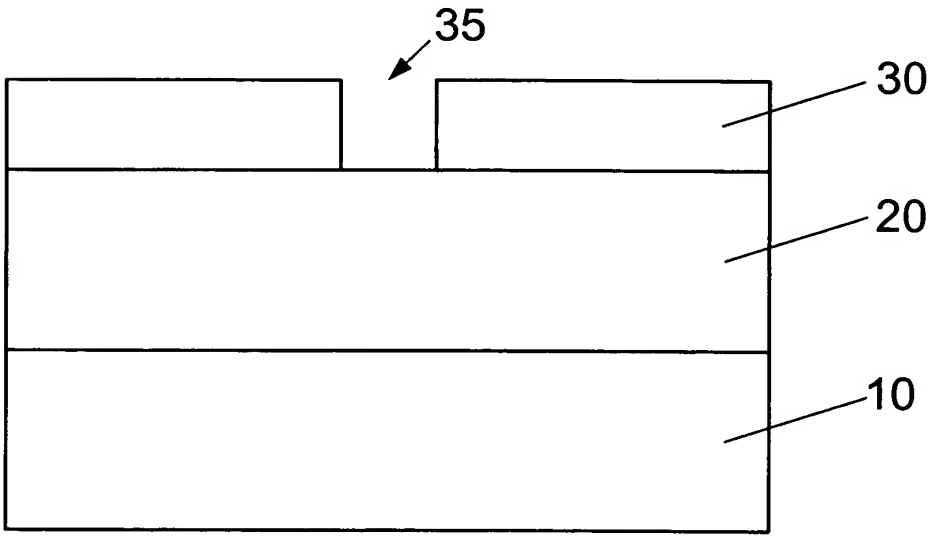

FIG. 1C

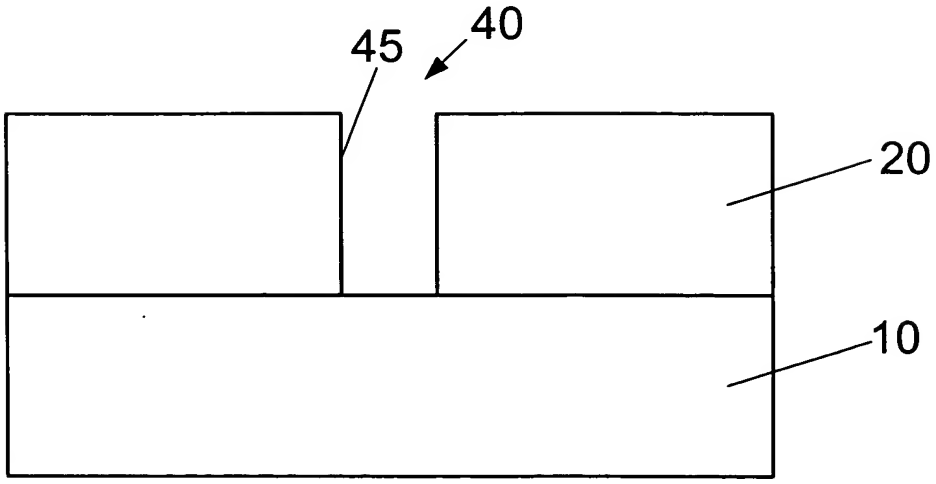

FIG. 1D

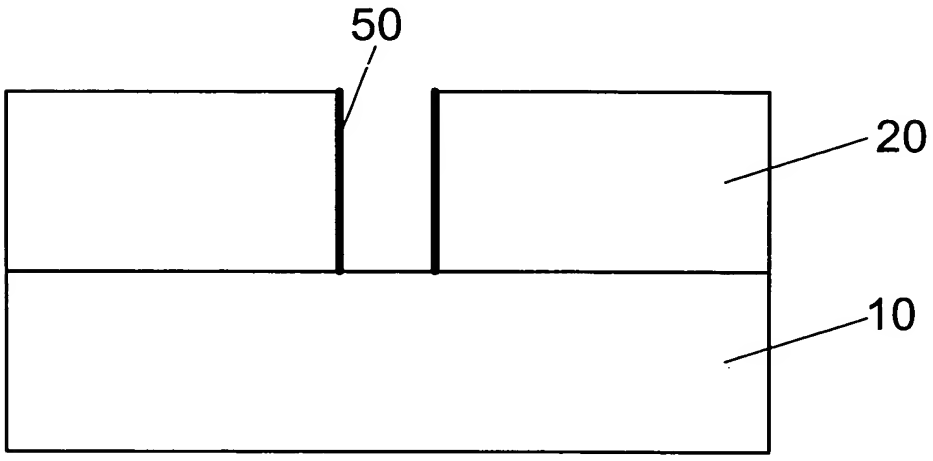

FIG. 1E

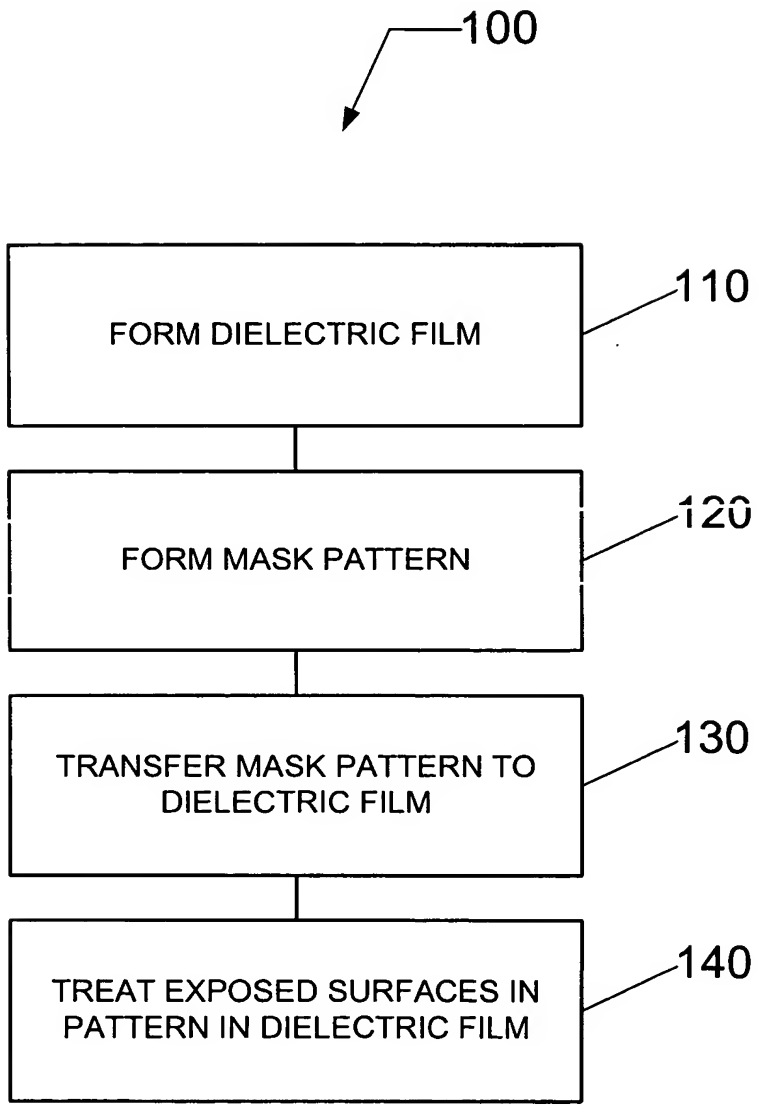
100
FORM DIELECTRIC FILM
110
FORM MASK PATTERN
120
TRANSFER MASK PATTERN TO DIELECTRIC FILM
130
TREAT EXPOSED SURFACES IN PATTERN IN DIELECTRIC FILM
140

FIG. 2

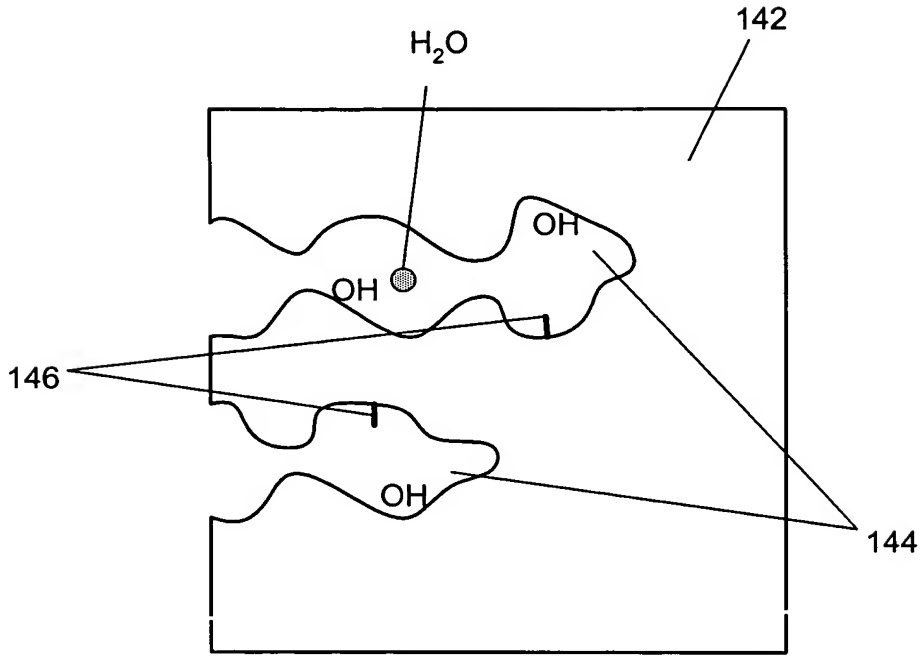
142
H_2O
OH
OH
146
OH
144

FIG. 3A

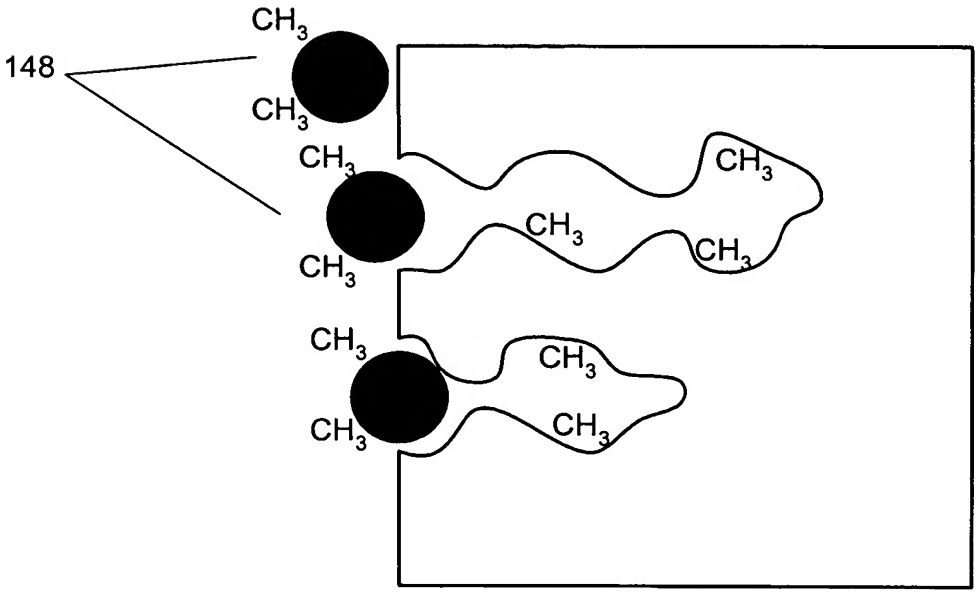
148
CH_3
CH_3
CH_3
CH_3
CH_3
CH_3
CH_3
CH_3
CH_3
CH_3

FIG. 3B

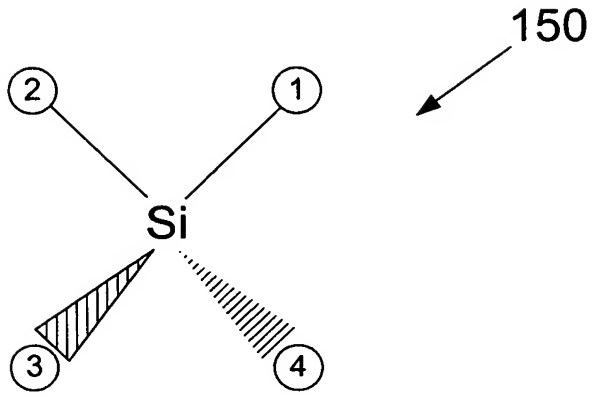

FIG. 4A

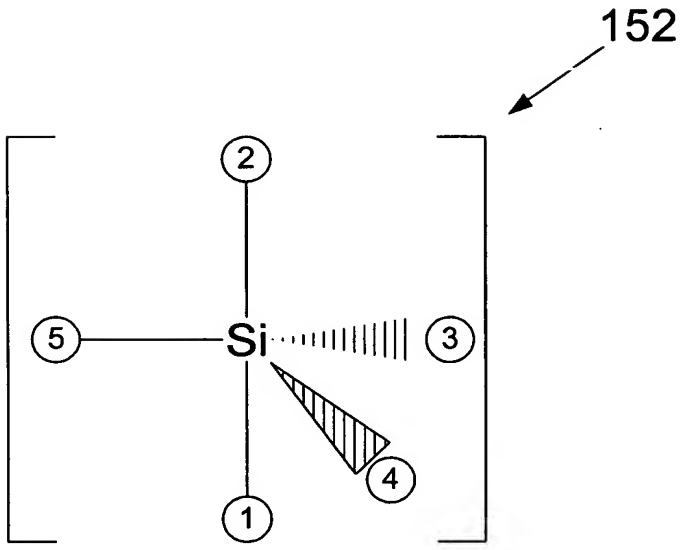

FIG. 4B

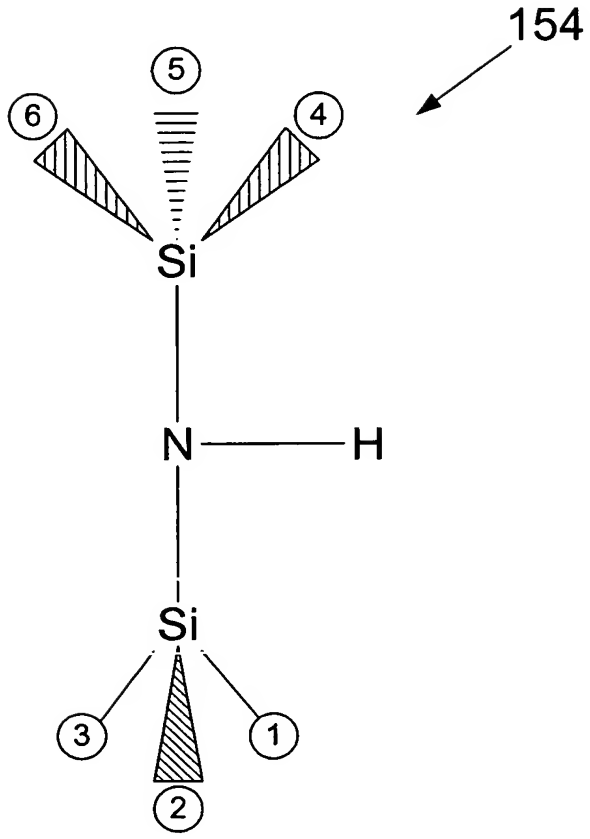

FIG. 4C

(1) $(CH_3)_3\,Si\text{-}NH\text{-}Si(CH_3)_3 + HO\text{-}Si\equiv_{(s)} \rightarrow (CH_3)_3\text{—}Si\text{—}O\text{—}Si\equiv_{(s)}$

(2) $(CH_3)_3\text{-}SiNH_{2(g)} + (HO\text{-}Si)\equiv_{(s)} \rightarrow (CH_3)_3\text{—}Si\text{—}O\text{—}Si\equiv_{(s)} + NH_{2(g)}$

FIG. 4D

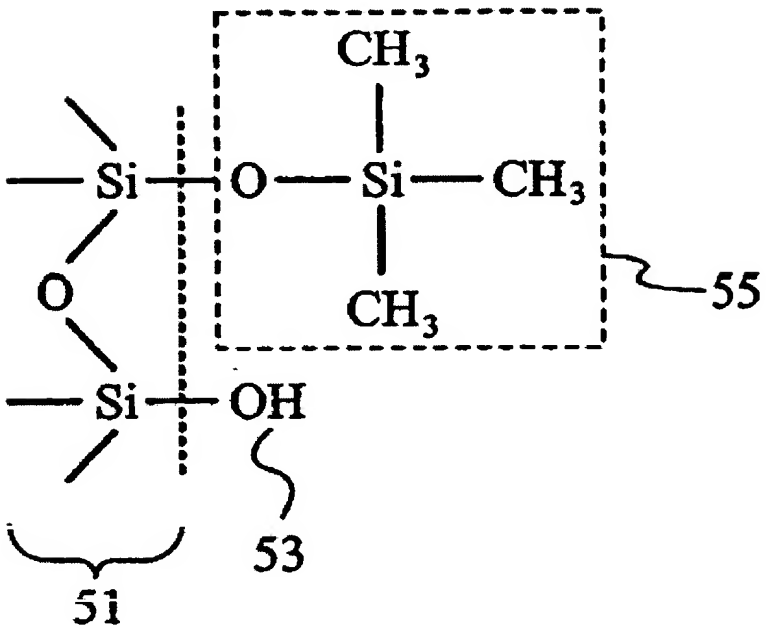

FIG. 4E

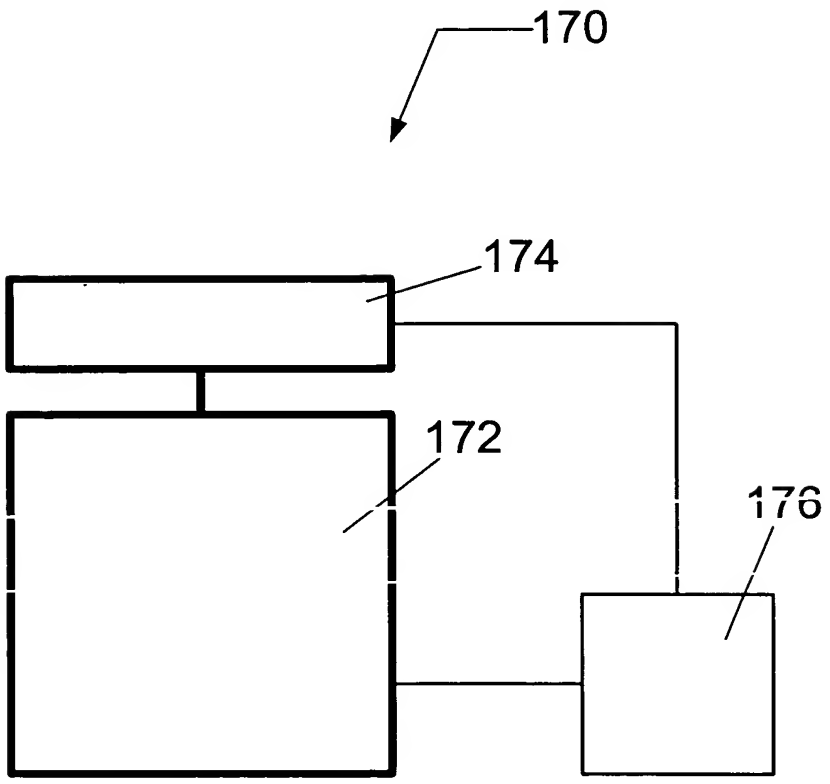

FIG. 5

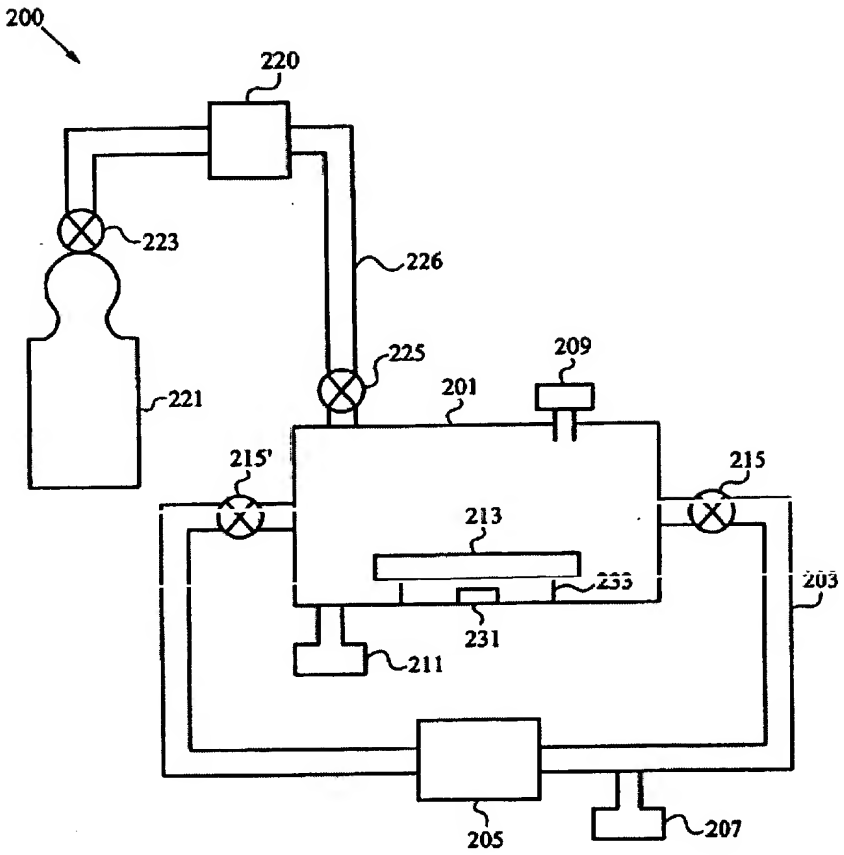
200
220
223
226
225
209
201
221
215'
215
213
233
231
203
211
205
207

FIG. 6

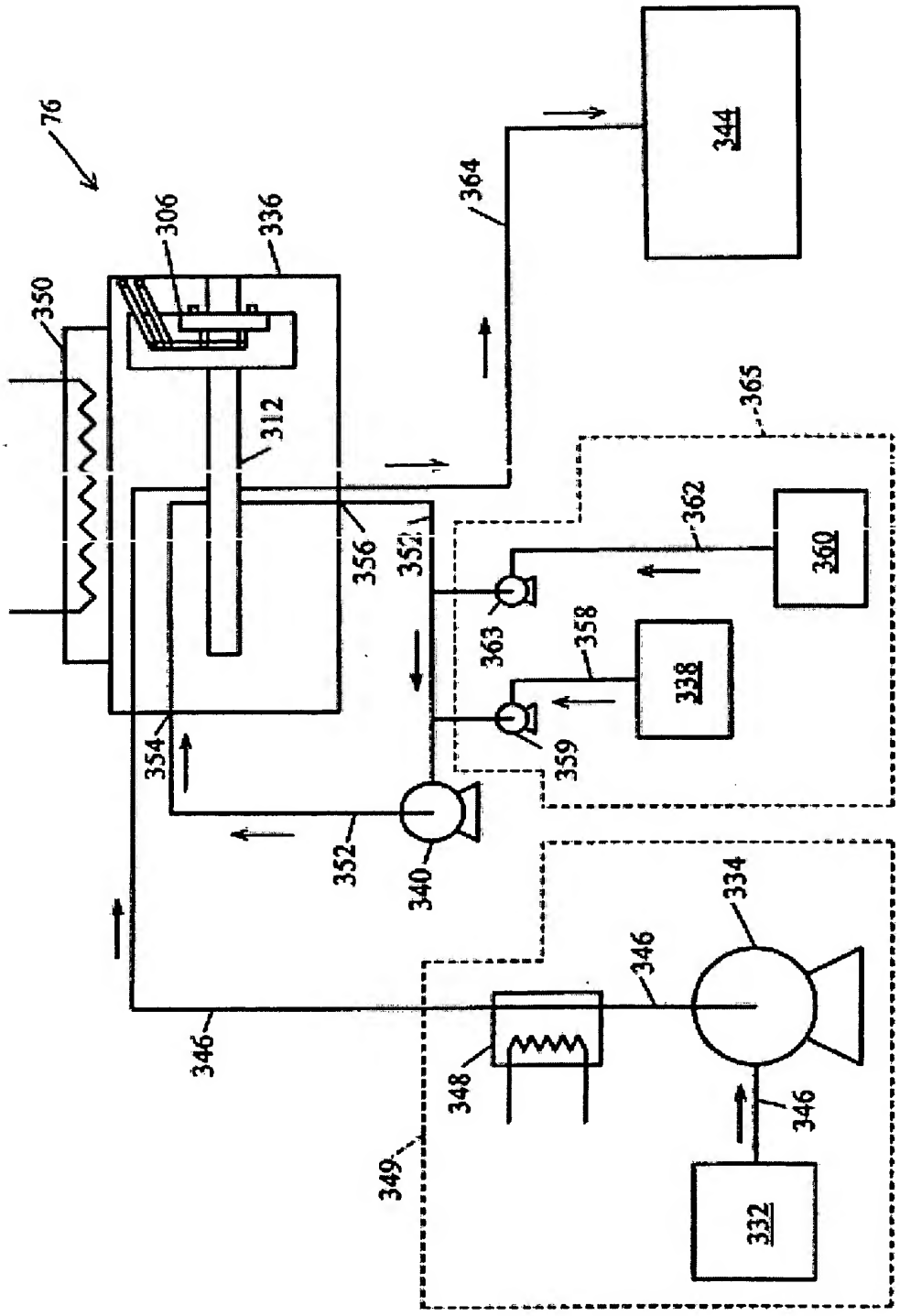
76
306
336
350
312
364
344
365
362
360
356
352
363
358
338
354
359
352
340
334
346
346
348
346
349
332

FIG. 7

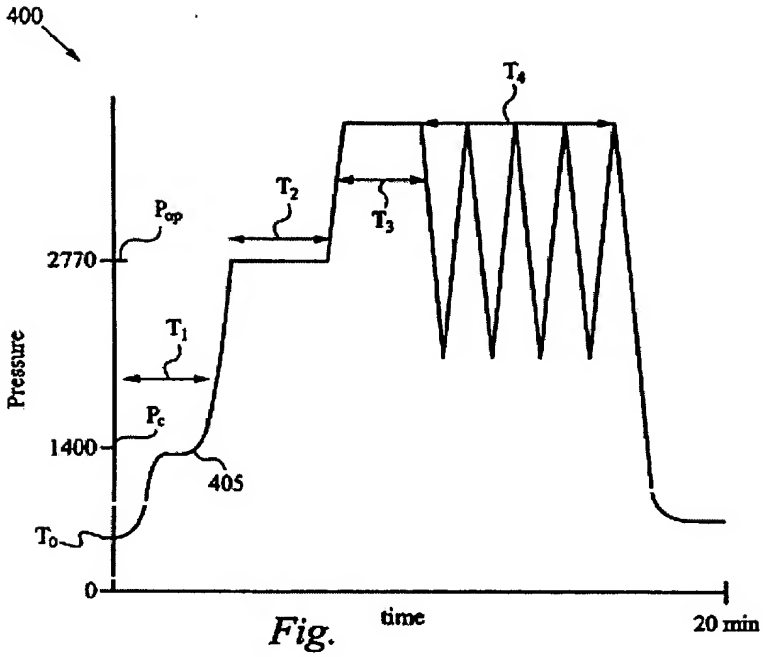

Fig.

FIG. 8

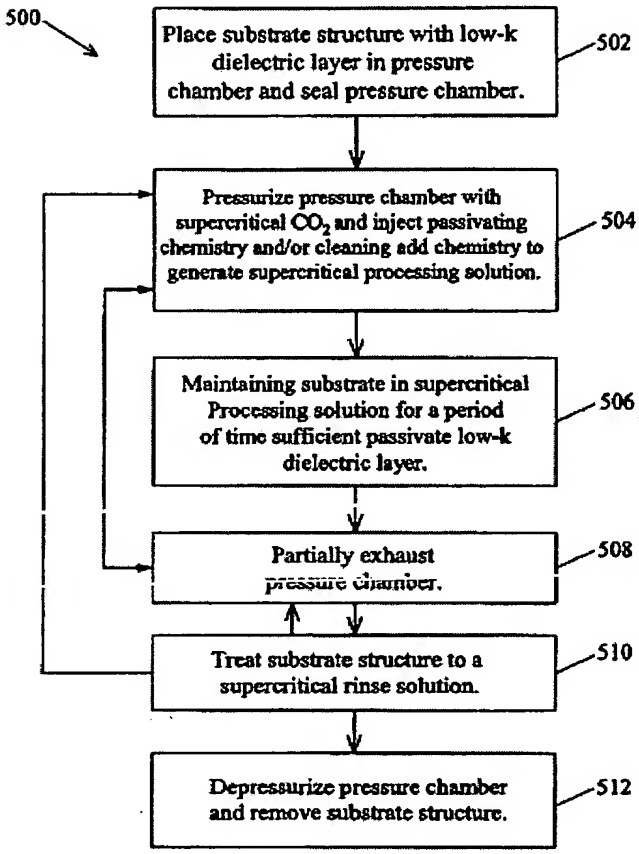
500
Place substrate structure with low-k dielectric layer in pressure chamber and seal pressure chamber.
502
Pressurize pressure chamber with supercritical CO_2 and inject passivating chemistry and/or cleaning add chemistry to generate supercritical processing solution.
504
Maintaining substrate in supercritical Processing solution for a period of time sufficient passivate low-k dielectric layer.
506
Partially exhaust pressure chamber.
508
Treat substrate structure to a supercritical rinse solution.
510
Depressurize pressure chamber and remove substrate structure.
512

FIG. 9

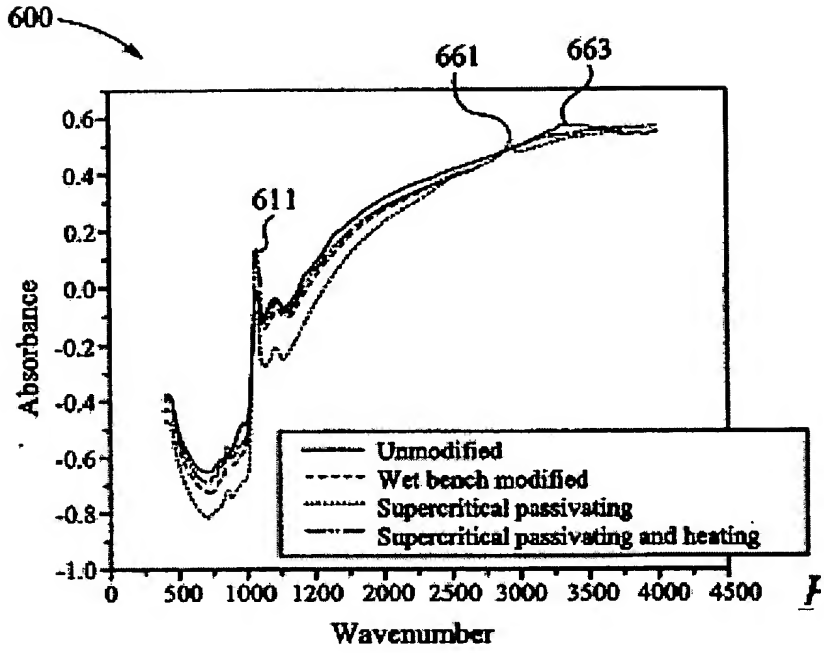

FIG. 10A

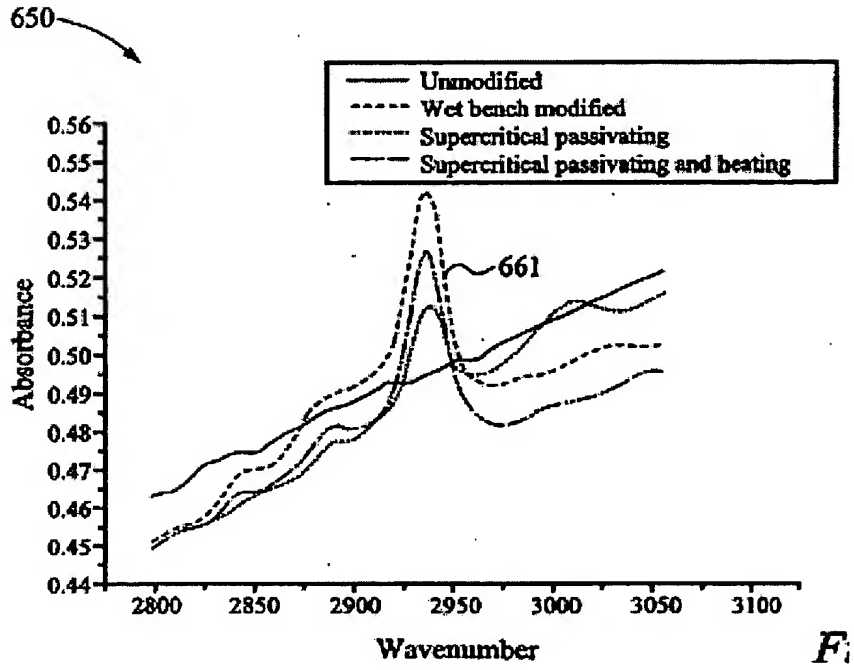

FIG. 10B